



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,100	12/03/2001	Robert A. Shepherd JR.	NOVEP015	9461

25920 7590 08/27/2003

MARTINE & PENILLA, LLP
710 LAKEWAY DRIVE
SUITE 170
SUNNYVALE, CA 94085

EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/006,100

Applicant(s)

SHEPHERD ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi et al (USPat. 5,217,559) in view of Alan Notman (USPat. 4,311,671). Moslehi teaches an apparatus (Figures 1,3,4) for managing plasma (column 5, lines 15-37) in wafer processing operations (column 2, lines 60-68) comprising:
 - i. A housing (Figure 3) having an fluid entry port (122) and a fluid exit port (152), the housing having an internal region (124, 162, 154) defined by a top horizontal wall (126/122 interface), a bottom horizontal wall (144) and a circular side wall (142)
 - ii. Three circular ("annular pumping space"; column 9, lines 55-63), horizontally placed, baffle plates (134, 132, 130; Figure 3), each of the baffle plates define a level in a multilevel structure formed in the internal region within the housing (Figure 3), each baffle plate being separated from one another and separated from both the top horizontal wall and the bottom horizontal wall by a separation spacing (Figure 3), each of the plurality of baffle plates including:
 - a. A plurality of holes (168), the plurality of holes in each of the baffle plates being oriented so that holes defined in each of the plurality of baffle plates are aligned thus defining a linear path for fluids designed to enter the entry port (Figure 3), traverse each level of the multilevel structure defined by the plurality of baffle plates, and leave the exit port of the housing

- b. A gas inlet port / fluid input (156, Figure 3) in at least one of the separating spacing (154), the gas inlet port configured to inject gas (160) into the housing in at least one of the separating spacing (154)
- iii. A housing (126, Figure 3) configured to have a first chamber (154) and a second chamber (162), the first and second chamber being separated by a wall (132) having a plurality of orifices (conduits, not labeled) the housing having an input / input port (122) at a first end for supplying a plasma (column 10, lines 17-41) into the first chamber and an output port (152) at a second end of the housing, the input port and the output port being aligned with each other and aligned with each of the plurality of orifices
- iv. The plasma supplied through the input port capable of mixing with the supplied fluid within the second chamber (154; column 10, lines 17-41) – this is inherent due to the variable flow rates permitted by Moslehi (“gas flow controller (not shown)”; column 6, lines 5-9)
- v. The gas inlet port (156, Figure 3) is in an uppermost separation spacing (154)
- vi. A gas port (164, Figure 3) is in a lowermost separation spacing (162)
- vii. The gas injected from the gas inlet port mixes with the plasma in the separation spacing (column 10, lines 17-41)
- viii. A fluid conduit (164) is provided in the second chamber

Moslehi then does not teach the plurality of holes are misaligned defining a nonlinear path for fluids. Moslehi does not teach that the posterior gas mixing undergoes turbulent mixing.

Alan Notman teaches a synthesis reactor (Figure 5) including baffles plates (16b', 16b'', 49') each with plurality of holes (52, 36 for 16b'; 53, 36 for 16b''; 54, 36 for 49') are misaligned defining a nonlinear path for fluid flow.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to shift (move) one or more of Moslehi's baffle plates horizontally such that each of the plurality of holes are misaligned defining a nonlinear path for fluid flow as taught by Alan Notman and to alter the flow rates of the injected gases to increase turbulent mixing.

Motivation to shift (move) one or more of Moslehi's baffle plates horizontally such that each of the plurality of holes are misaligned defining a nonlinear path for fluid flow as taught by Alan Notman is to provide for a nonlinear flow through the reactor.

Motivation to alter the flow rates of Moslehi's injected gases to increase turbulent mixing is to optimize the mixing of the plasma and nonplasma gases. Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); *In re Kulling*, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

3. Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi et al (USPat. 5,217,559) and Alan Notman (USPat. 4,311,671) in view of James W. Rudolph (USPat. 5,480,678). Moslehi and Alan Notman are discussed above. Moslehi further teaches a wafer processing chamber (152, Figure 3). Moslehi does not teach perforated hollow tubes. However Alan Notman does teach hollow tube conduits that are not perforated.

James W. Rudolph teaches a similar gas dispersion plates (104, Figure 6) that are also staggered. James W. Rudolph further teaches a hollow tube conduit (17, Figure 6) that is perforated.

Art Unit: 1763

It would have been obvious to one of ordinary skill in the art at the time the invention was made to perforate Alan Notman's holes (52, 36 for 16b'; 53, 36 for 16b''; 54, 36 for 49') in Moslehi's plasma processing chamber.

Motivation to perforate Alan Notman's holes in Moslehi's plasma processing chamber is to disperse the process gasses along the path of flow as taught by James W. Rudolph.

Response to Arguments

4. Applicant's arguments filed June 16, 2003 have been fully considered but they are not persuasive.

5. Applicant's position that Moslehi's process environment space 152 is not a "fluid exit port" or an "output port" as claimed by Applicant is not convincing. Moslehi's process environment space 152 is clearly shown in all Figures including Figure 3 and 4 that his process environment space 152 provides a fluid exit and an output of said fluid. Apparently, Applicant believes that Moslehi's process environment space 152 must then not be a port. The Examiner defers to the dictionary definition of "port" in support of the rejection¹.

6. Applicant states that "the Office then appears to equate the top horizontal wall as claimed in claim 1 with what is termed a module 126 and process plasma tube outlet 122 by Moslehi". Applicant is mistaken. The Examiner clearly stated "the housing having an internal region (124, 162, 154) defined by a top horizontal wall (126/122 interface), a bottom horizontal wall (144) and a circular side wall (142)". Moslehi's top horizontal wall is that portion of item 126 (Figure 3) where 126 is horizontal, i.e., the 126/122 interface.

7. With regards to Moslehi's gas control inlet 156, Figure 3 meets the claimed invention - "a gas inlet port in at least one of the separating spacings (154, Figure 3)". Further, the Examiner asserts that Moslehi teaches a housing (126, Figure 3) configured to have a first chamber (154) and a second chamber (162), the first and second chamber being separated by a wall (132) having a plurality of orifices (conduits, not labeled) the housing having an input / input port (122) at a first end for supplying a plasma (column 10, lines 17-41) into the first chamber and an output port (152) at a second end of the housing, the input port and the output port being aligned with each other and aligned with each of the plurality of orifices. Thus, Moslehi's gas control inlet or fluid input 156 supplies fluid into at least one of the first chamber and the second chamber.

8. Applicant states that optimization case law does not support the obviousness rejection because "a particular parameter" was not recognized. The Examiner disagrees. The Examiner specifically stated that mixing is the entity that would be optimized - "Motivation to alter the flow rates of Moslehi's injected gases to increase turbulent mixing is to optimize the mixing of the plasma and nonplasma gases. Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention ...".

9. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the

¹ Port *n* 2a: an opening (as in a valve seat or valve face) for intake or exhaust of a fluid. Merriam-Webster's

Art Unit: 1763

applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

10. Regarding Applicant's traversal of claim 18, it was stated that Moslehi teaches "a housing (Figure 3) having an fluid entry port (122) and a fluid exit port (152), the housing having an internal region (124, 162, 154) defined by a top horizontal wall (126/122 interface), a bottom horizontal wall (144) and a circular side wall (142)", as such Applicant's position that "the wafer processing chamber 152 is the location where the wafer is processed and does not include both an input port for supplying plasma and an output port as claimed by claim 18" does not identify the claimed subject matter of claim 18. In particular, claim 18 is not limited by a "wafer processing chamber is the location where the wafer is processed and does not include both an input port for supplying plasma and an output port". As a result, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "a wafer processing chamber is the location where the wafer is processed and does not include both an input port for supplying plasma and an output port") is not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

11. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge

Art Unit: 1763

generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, there is teaching, suggestion, and motivation in the references of Moslehi et al, Alan Notman, and James W. Rudolph to combine the references themselves (see motivation statements above) and in the knowledge generally available to one of ordinary skill in the art (see motivation statements above).

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311.

Art Unit: 1763

The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

A handwritten signature in black ink, appearing to read "Jeffrie R. Lund".

**JEFFRIE R. LUND
PRIMARY EXAMINER**